



Welcome

Restoration Advisory Board
Meeting

Robins Air Force Base
13 September 2001



We pause

**To honor the memory
of the individuals who lost their
lives
on 11 September 2001.**



Restoration Advisory Board Meeting

Robins Air Force Base

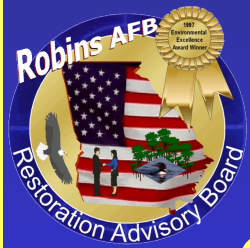
13 September 2001

***Theme: Current Remediation
Designs***



Welcome and Program Introduction

Mr. Steven W. Coyle
Installation Co-Chair



Remedial Design for the Greater Base Industrial Area



Mr. Mike Breazeale, WR-
ALC/EMQ

Mr. Brent Jacobs, URS Corp.

September 13, 2001



DESIGN INCLUDES

- SWMU 20
- SWMU 10B
- SWMU 40 and the Old Wet Wing

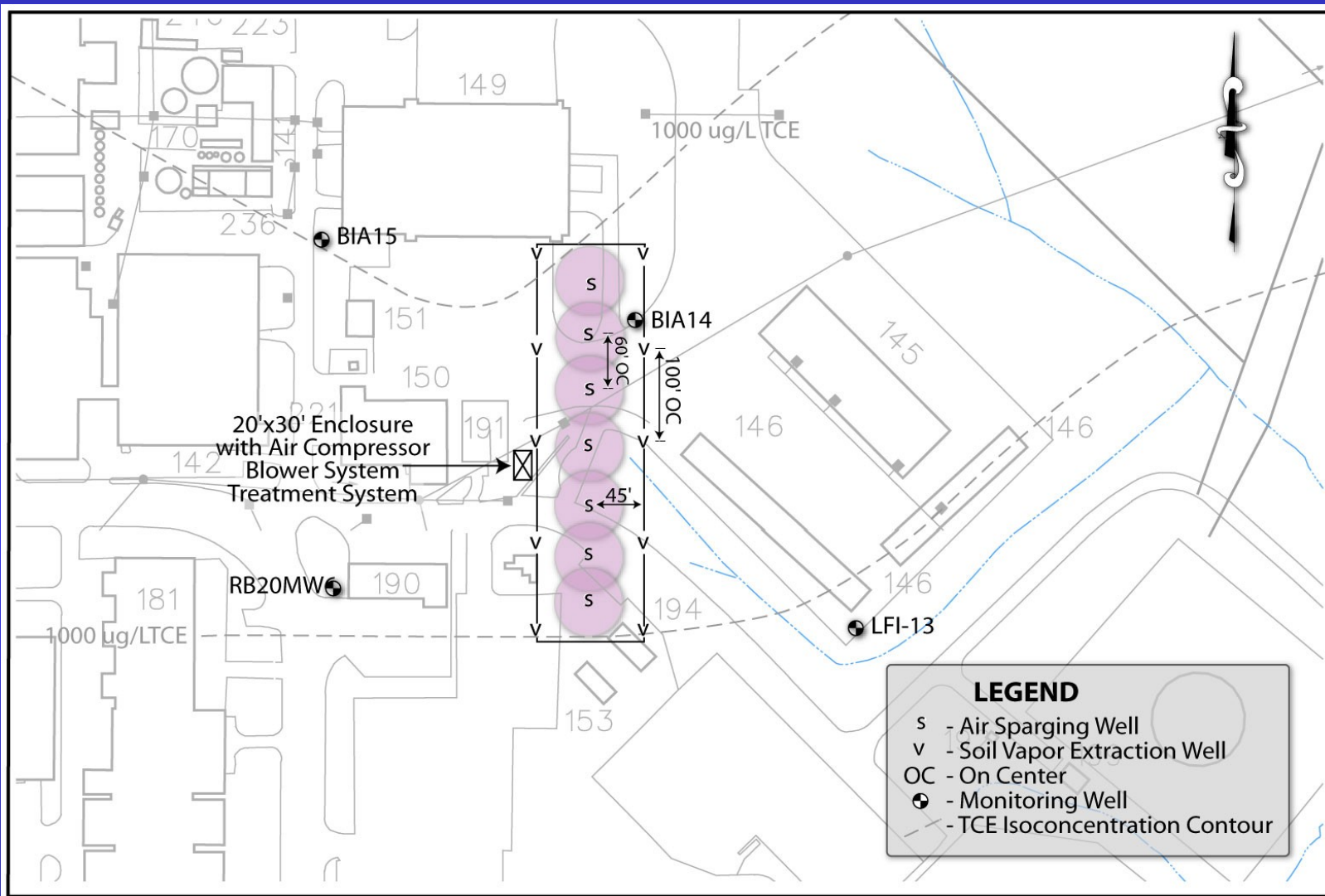


SWMU 20 AIR SPARGING / SOIL VAPOR EXTRACTION SYSTEM

- System will treat VOCs in groundwater.
- Air Sparge/SVE System will contain an array of air sparge and SVE wells.
- Sparge wells will be installed below water table.
- SVE will be installed in unsaturated zone.
- Collected vapors will be treated with granular activated carbon.

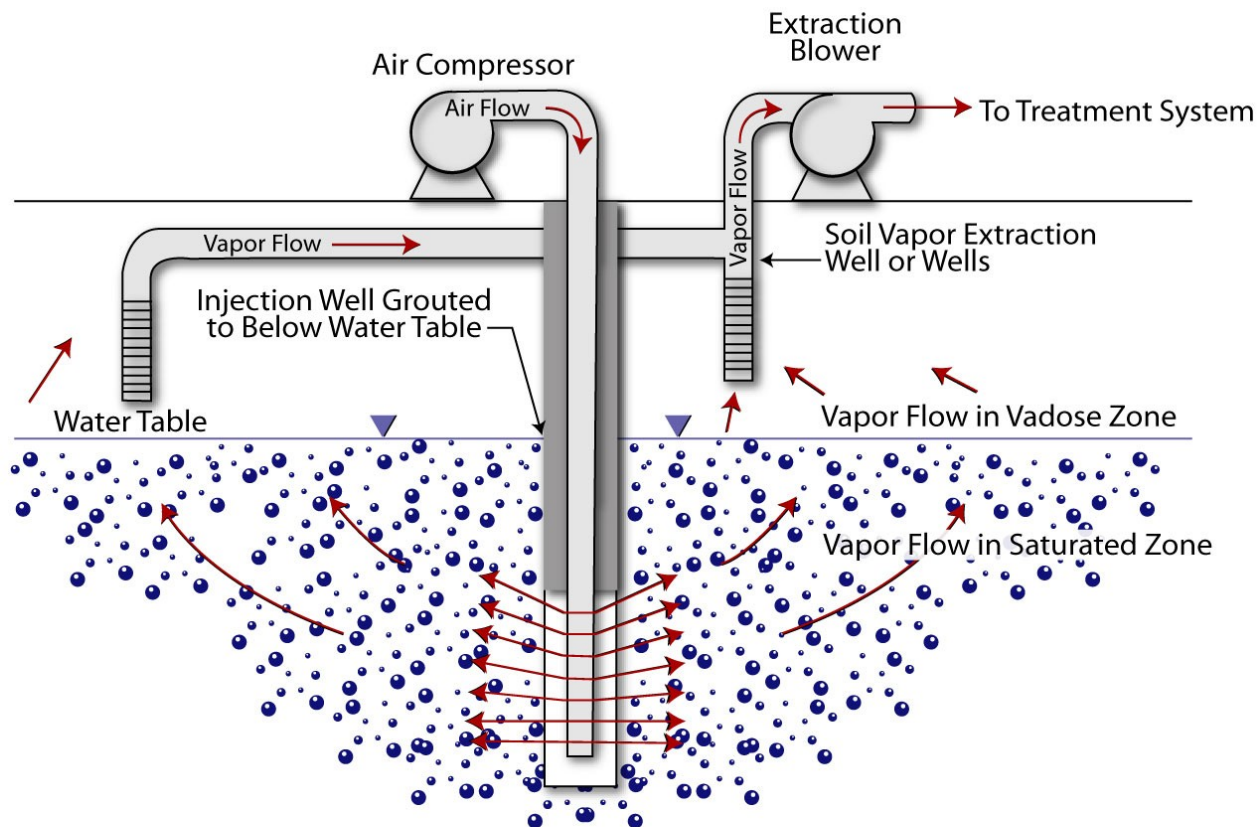


SWMU 20 AIR SPARGING/SVE LAYOUT





SCHEMATIC OF AIR SPARGE /SVE SYSTEM



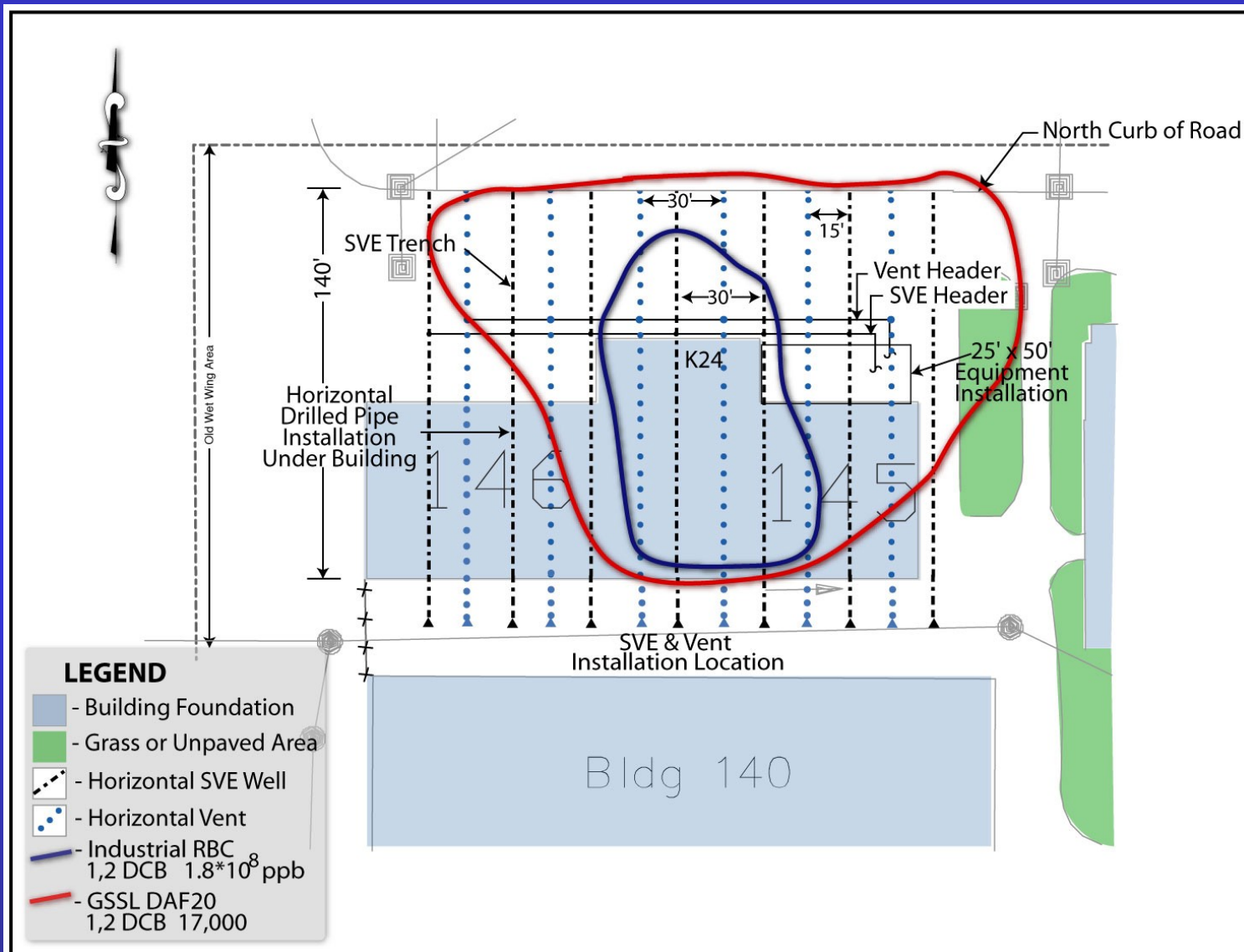


SWMU 40 & OLD WET WING AREA SVE SYSTEM

- System to treat VOCs in soils underneath and north of Building 145.
- System will consist of horizontal SVE and vent wells in unsaturated zone.
- Off gases will be treated by thermal oxidation unit.



SWMU 40 & OLD WET WING SYSTEM LAYOUT



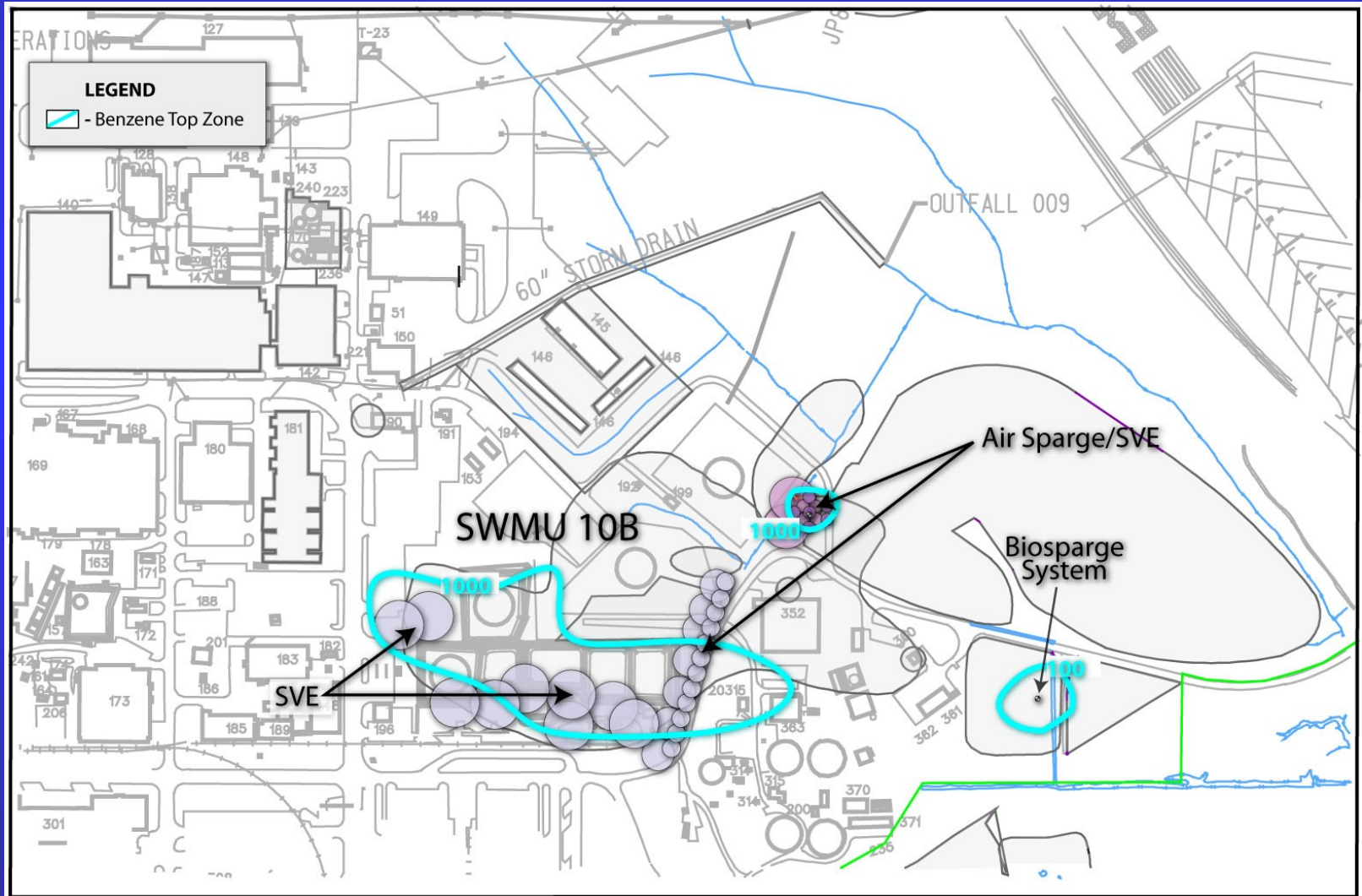


SWMU 10B AIR SPARGING /SOIL VAPOR EXTRACTION

- Air Sparging/SVE will be utilized to treat benzene contaminated groundwater on east side of POL farm.
- SVE system will be installed inside POL area to treat soils exceeding RLs.
- Convert an existing soil bioventing system to an air sparging /SVE system to treat a benzene groundwater hotspot.
- Install a biosparge system west of wetlands to treat a benzene hotspot.



SWMU 10B SYSTEMS





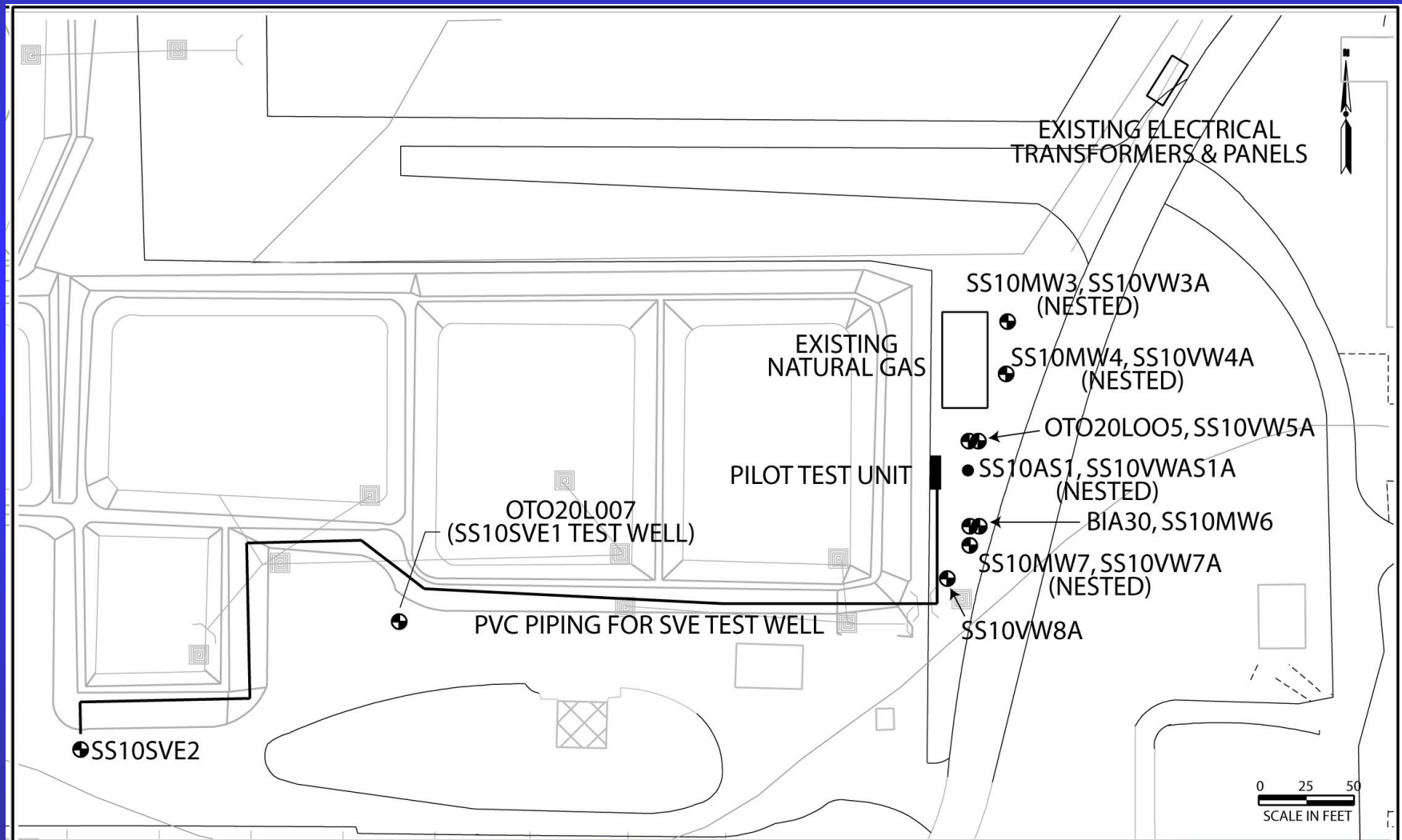
PILOT TESTING FOR SWMU 10B AND 40

Pilot tests are being performed to determine:

- Radial distribution
- Zone of influence
- Airflow rate
- Vacuum pressure
- Initial VOC removal rates



SWMU 10B PILOT TEST LAYOUT





SWMU 10B PILOT TEST



Pilot Test

- Consisted of one air sparge well and 3 SVE wells.
- Performed air sparging and SVE testing.
- Monitored 7 unsaturated zone wells during testing.
- Monitored 5 groundwater wells during air sparging test.



SWMU 10B

PRELIMINARY TEST RESULTS

SVE

- Radius of Influence 80-100' at 100" of water column.
- Airflow Rate 80 scfm at 100".
- Vapor Concentration of COCs at
 - BIA30 - 717 ppm
 - SVE2 - 4,800 ppm
- Total Gaseous Non-Methane Organics
 - 437,000 ppm at POL
 - 178,000 ppm at Sparge Curtain

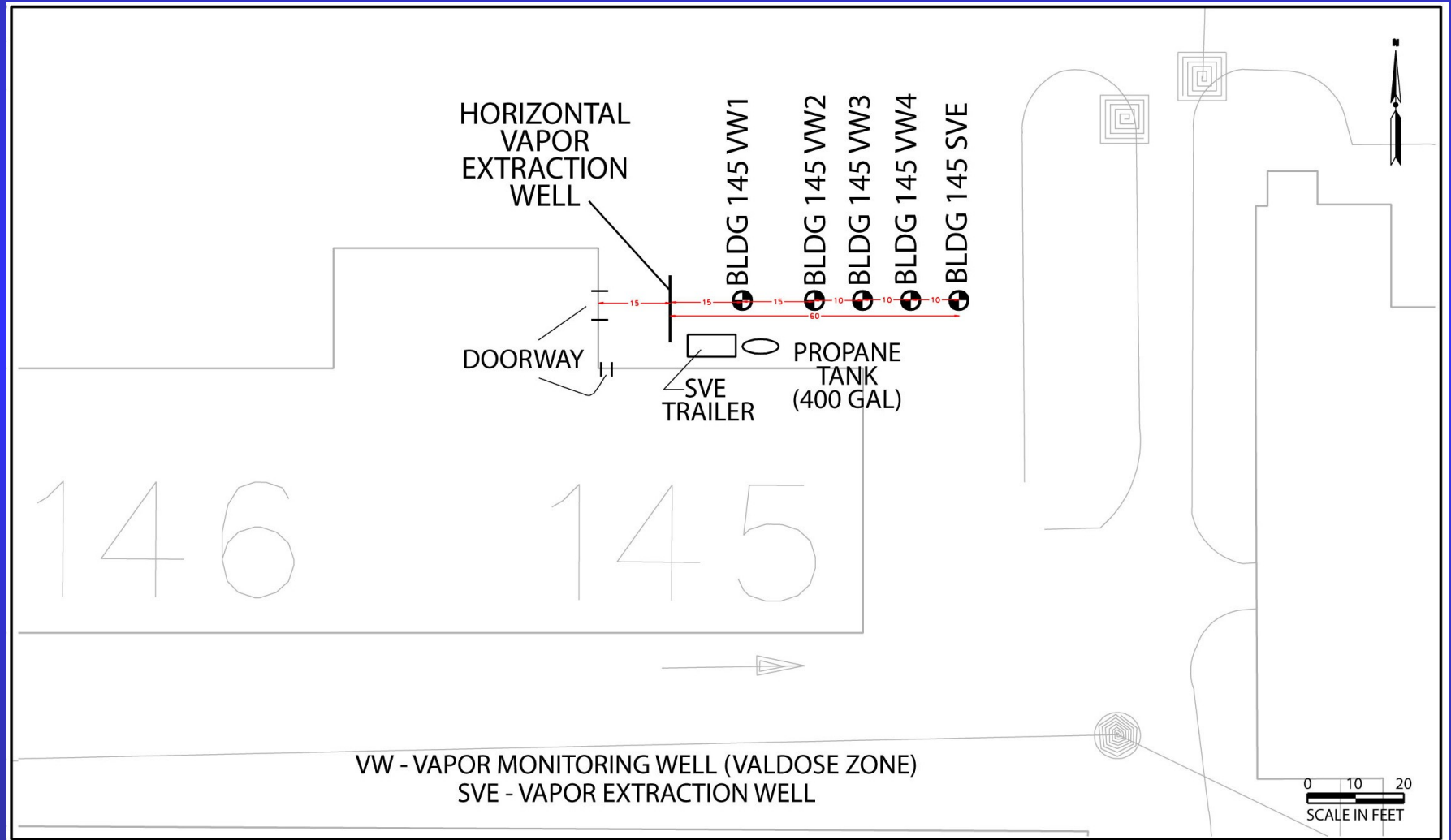
Air Sparging

- Radius of Influence 30-50'.
- Helium Trace detected at 30'.
- Operating Pressure 22.5 psi.





SWMU 40 & OLD WET WING PILOT STUDY LAYOUT





SWMU 40 & OLD WET WING PILOT TEST



Pilot Test

- Consisted of a horizontal SVE well and one vertical SVE well.
- Performed a 48-hour pilot study.
- Monitored 4 vapor wells during test to assess radius of influence.



SWMU 40 & OLD WET WING PILOT STUDY

PRELIMINARY TEST RESULTS

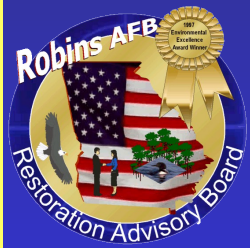
Horizontal Well

- Radius of Influence 60-80' at 100" of water column.
- Airflow Rate 160 scfm at 100".
- Vapor Concentration at 100" - 350 ppm total VOCs.

Vertical Well

- Radius of Influence 50-60' at 100" of water column.
- Airflow Rate 60 scfm at 100".
- Vapor Concentration at 60" - 375 ppm total VOCs.





Remedial Design for SWMUs 59, 60, and 61



Mr. Steven Battle, WR-ALC/EMQ

Mr. Steve Hvizdzak, CAPE
Environmental

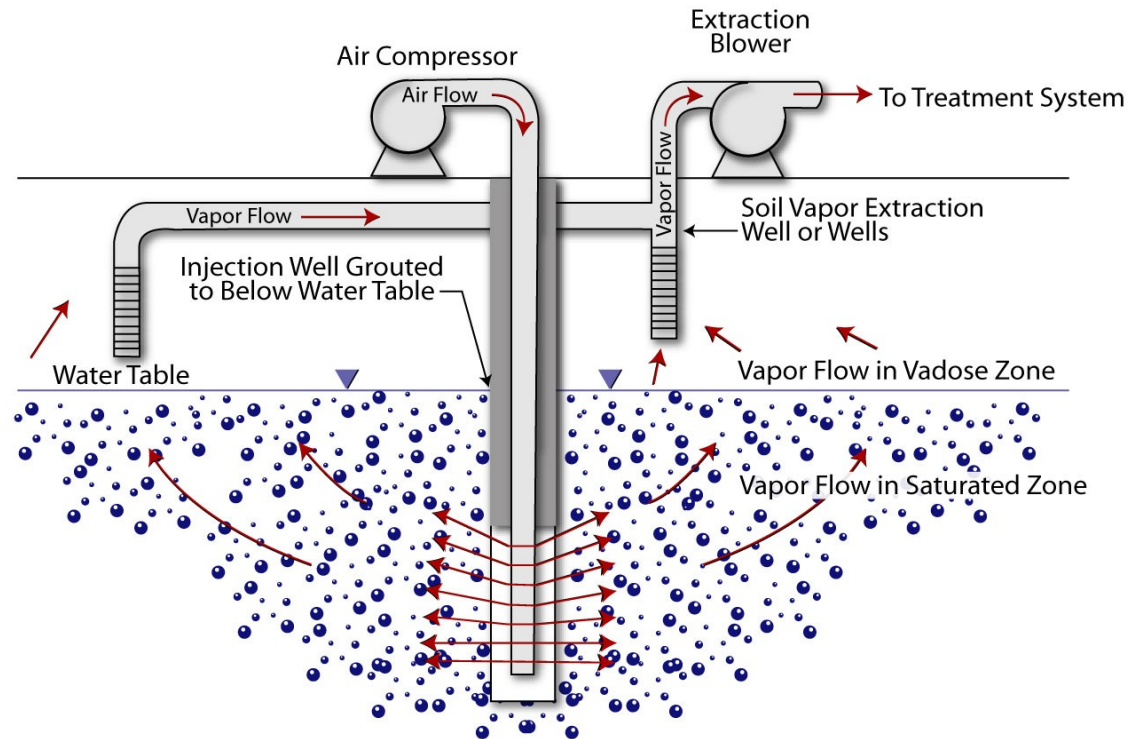


SWMUs 59, 60, and 61 Contamination Overview

- Petroleum hydrocarbon contamination released from jet fuel lines
- Free product and fuel-related subsurface soil contamination
- Perched zones
- Benzene groundwater plumes
- Contamination beneath taxiways



SCHEMATIC OF AIR SPARGE /SVE SYSTEM

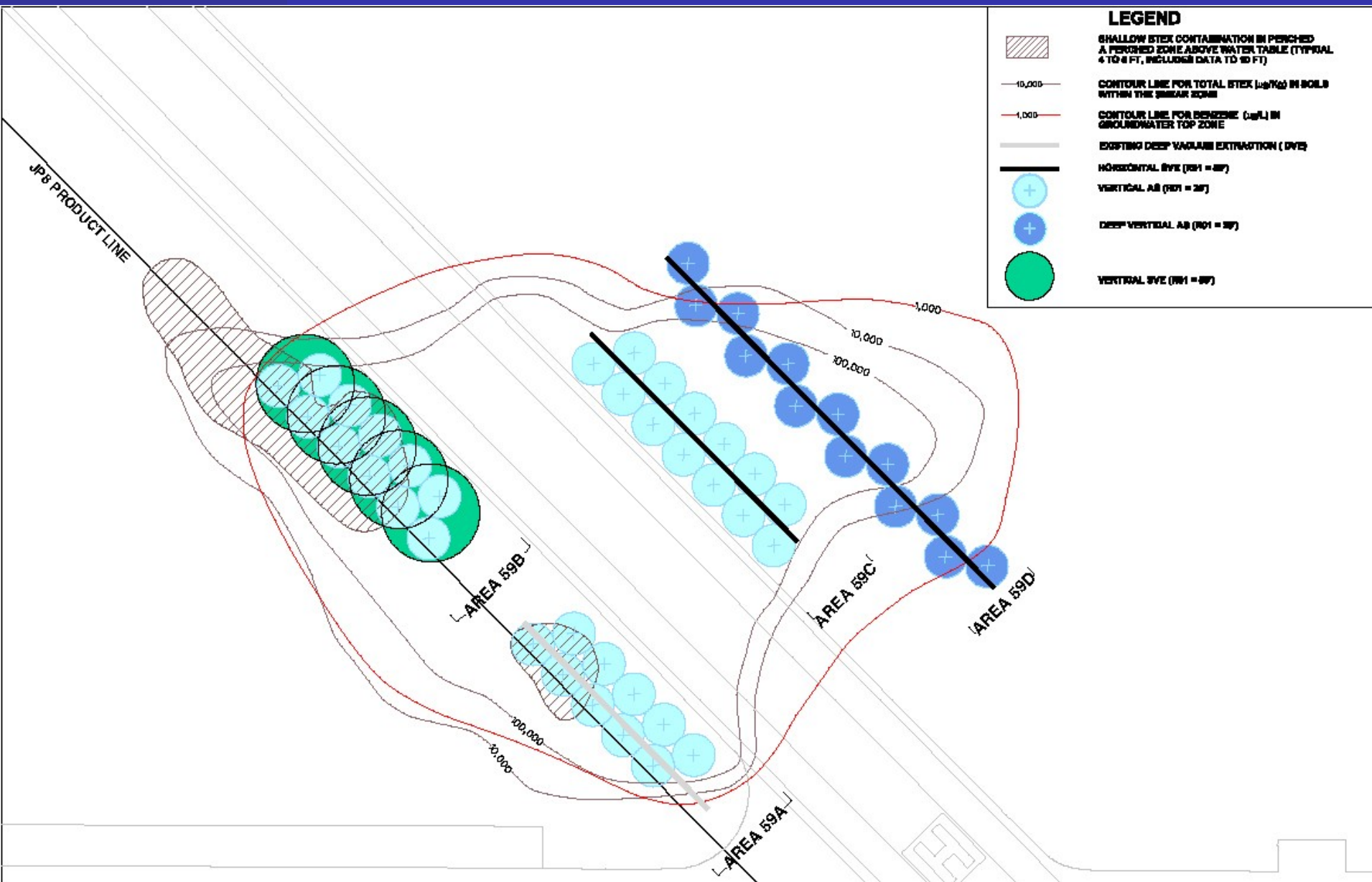




Design Aspects of the System

- SWMU 59 Source Area
 - AS/SVE systems in four areas on both sides of taxiway
 - AS wells below the water table to volatilize contaminants
 - AS well cutoff curtain to treat elevated groundwater contamination area
 - Vertical/horizontal SVE wells for source removal

SWMU 59

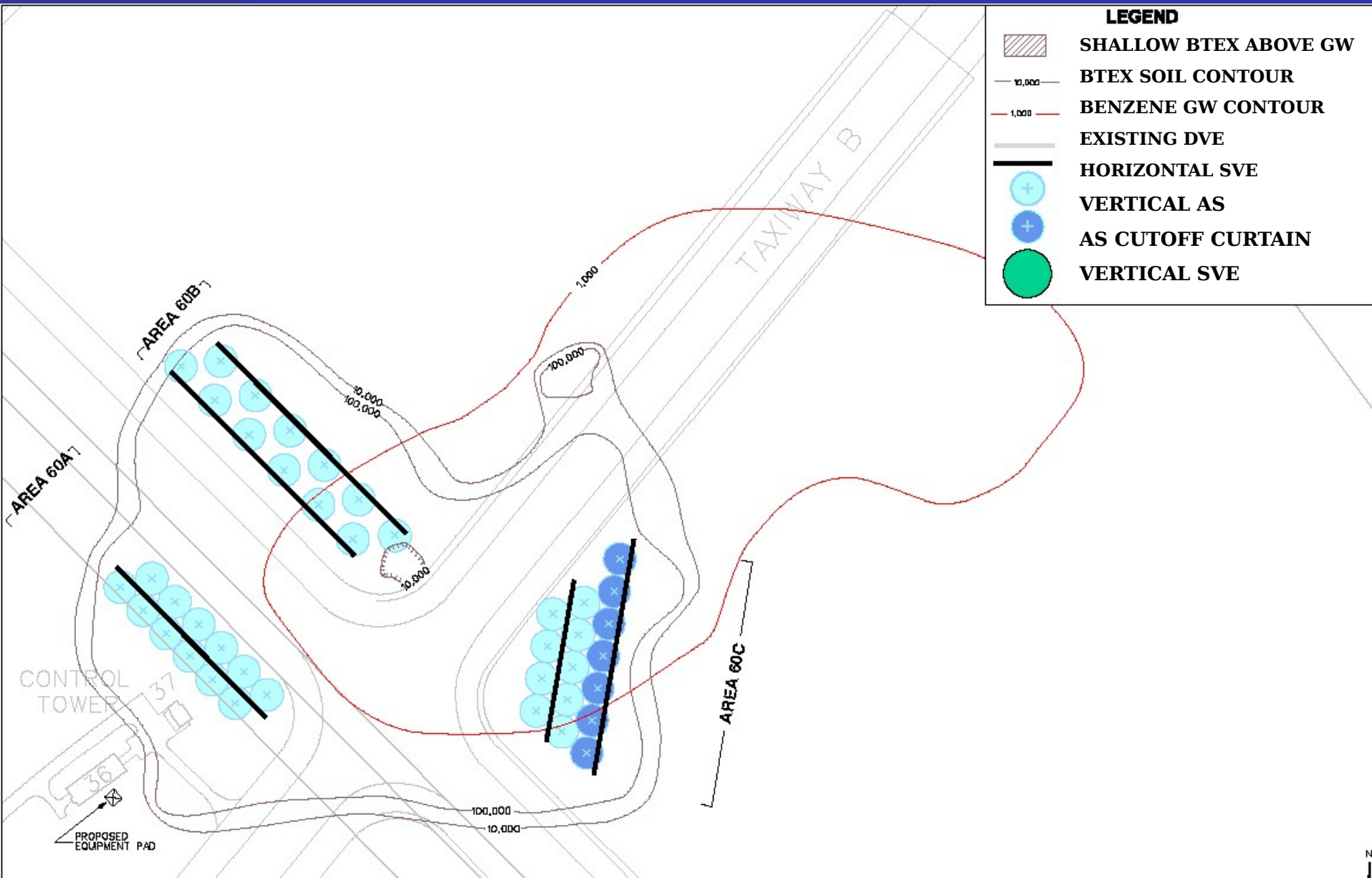




Design Aspects of the System

- SWMU 60 Source Area
 - AS/SVE systems in three areas around taxiway intersection
 - AS wells below the water table to volatilize contaminants
 - AS well cutoff curtain to treat elevated groundwater contamination area
 - Vertical and horizontal SVE wells for source removal

SWMU 60





Design Aspects of the System

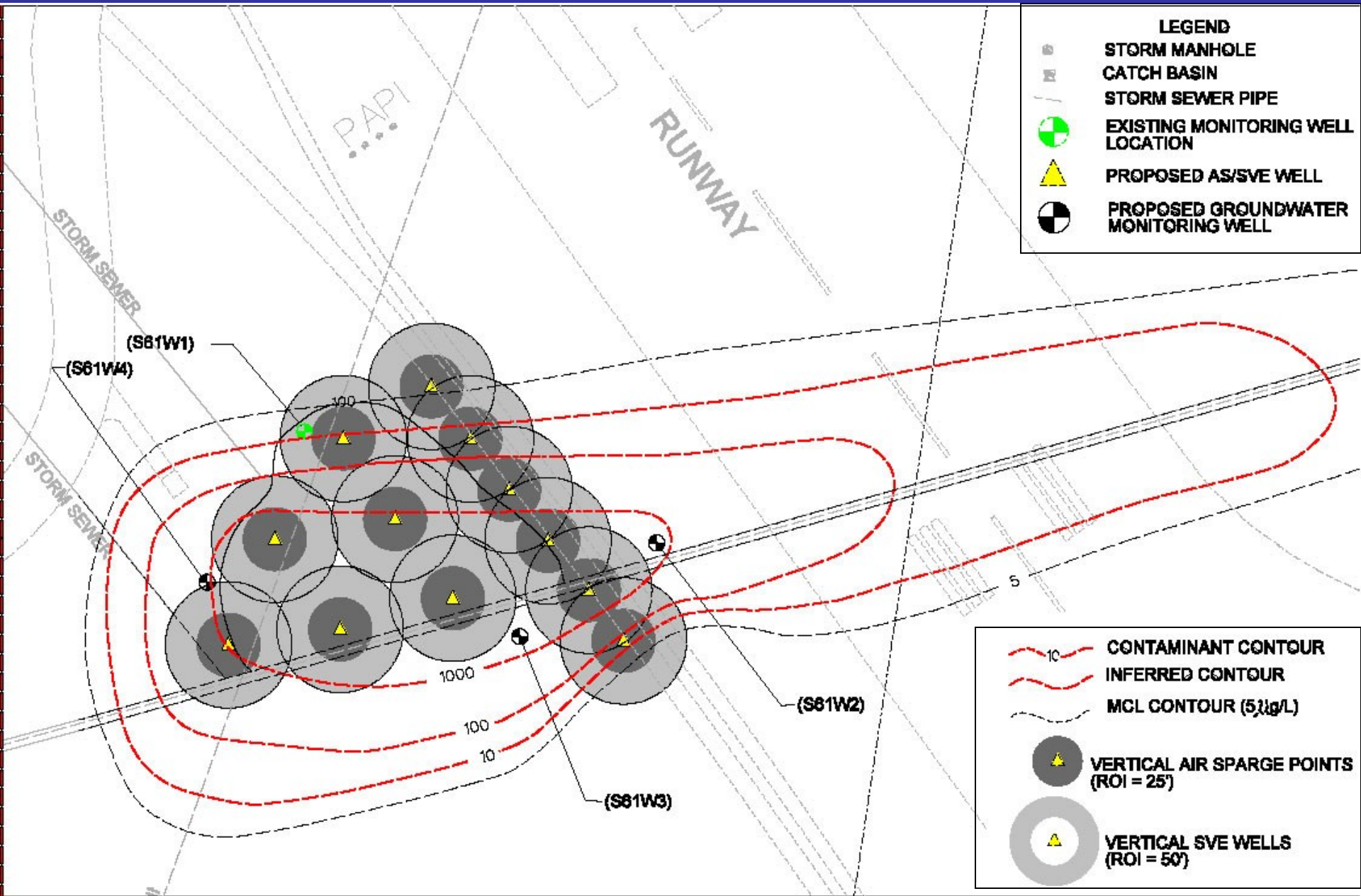
- SWMU 59/60 Downgradient Groundwater
 - AS cutoff curtain at source area reduces downgradient concentrations
 - In-situ biodegradation
 - Modeling indicated relatively stable plumes
 - Monitored natural attenuation



Design Aspects of the System

- SWMU 61
 - Integrated AS/SVE wells located in source area on north side of culvert
 - AS wells below the water table to volatilize contaminants
 - Vertical SVE wells for source removal
 - Reduce soil contamination to risk-based levels (protection of groundwater)
 - In-situ biodegradation

SWMU 61





Planned Treatment Technologies for Future System

- Extracted gases
 - treated by thermal oxidation units
 - 95% destruction efficiency
- Extracted liquids
 - oil-water separator
 - fuel/residuals recovered for energy recovery or disposed off-site
 - water discharged to IWTP #2



Operation and Power Sources

- Designed for unattended operation
- AS/SVE performance monitoring and adjustment
- O&M
- Equipment pads
- Existing utilities
- Portable generator
- Diesel and propane supply



Design Basis - Pilot Tests

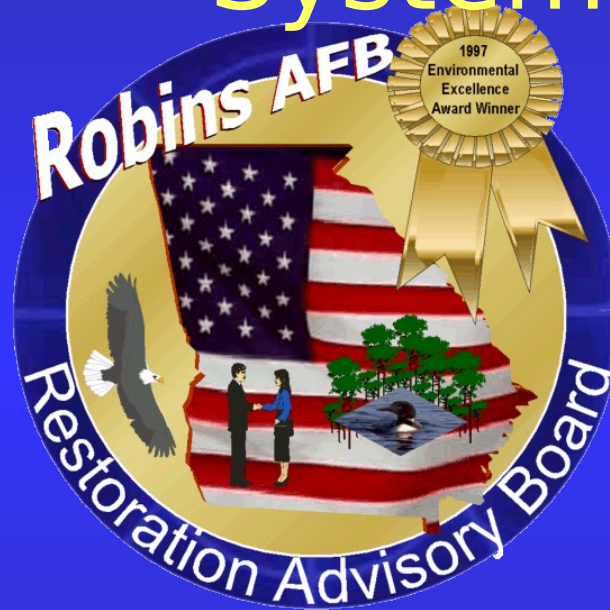
- Optimize layout and sizing of AS and SVE components
- SWMU 59, one AS well to be used with existing extraction system
- SWMU 59 results applied to SWMU 60
- SWMU 61, one vertical AS well and one vertical SVE well
- New and existing monitoring wells for baseline and performance data



Status & Estimated Completion

- Currently developing site plans
- Pilot study to begin on September 12, 2001
- Site remediation planned for late 2002
- Active AS/SVE system is planned to operate for 2 - 5 years
- Monitored natural attenuation will continue for 30 years

Phase III Expansion of the Groundwater Treatment System



Mr. Mark MacEwan, P.E. ,
Earth Tech

September 13, 2001



Phase III Expansion: What Does it Include?

- OT20 (SWMU 1, 2, 20, 37, 38, 39, 40, 55, and 69) - Greater Base Industrial Area
- OT37 (SWMU 62) - Third Street Storm Sewer
- OT41 (SWMU 57)- Twin 72-inch Underground Storm Drain Culvert System Through South Flightline



What Are The Contaminants?

- Groundwater Contaminated with Volatile Organic Chemicals Primarily Including:
 - Trichloroethene
 - Chlorobenzene
 - cis-1,2-Dichloroethene
 - Perchloroethene
 - Vinyl Chloride



Where Did They Come From?

OT20 (GBIA)

- Various Industrial Sources

OT37 (Third Street Storm Sewer)

- Various Industrial Sources Near the Third Street Storm Sewer

OT41 (Twin 72-inch Storm Drain)

- Leaks From Corroded Sections of the Storm Drains



Regulatory History

OT20 (GBIA)

- Phase II RFI Completed in August 2000
- Draft Final CAP Submitted to GA EPD dated July 2001

OT37 (Third Street Storm Sewer)

- RFI Completed in November 1999
- Draft CAP Submitted to GA EPD dated March 2001

OT41 (Twin 72-inch Storm Drain)

- RFI Completed in July 2000
- Draft CAP to be Completed in March 2002



Regulatory Drivers

- Georgia Safe Drinking Water Act Maximum Contaminant Levels (MCLs)
- EPA Region III Risk-based Values for Tap Water
- Remedial Levels Determined for Contaminant Sources Having a Potential to Impact the OU2 Wetlands



Overall Goals of Remediation

Achieve MCLs in Groundwater Through:

- Mass Removal and Treatment at GWTP
- Air Sparging/Soil Vapor Extraction (OT20)
- Natural Attenuation



Options Considered

- No Action
- Institutional Controls
- Bioremediation
- Natural Attenuation
- Circulating Well System
- Groundwater Extraction
- Groundwater Treatment
- Permeable Reactive Barrier
- Air Sparging/Soil Vapor Extraction (OT20)



Why Remedy Was Selected

Extraction (Pump and Treat)

- GWTP Already Built With Available Capacity
- GWTS Has Consistently Met Treatment Requirements of NPDES Permit
- GWTS Should Handle Additional Groundwater at a Lower Per Unit Cost Than Installing New Treatment System



Design Basis - Flow Chart





Design Basis - Extraction Wells

- Updated Groundwater Model
- Thirteen Extraction Wells
 - Seven in the OT20 Area
 - Two in OT37 Area
 - Four in the OT41 Area



Design Basis - Force Main

- Estimated 8,500 Feet of Dual Contained Underground High Density Polyethylene (HDPE) Piping
- Leak Detection
- Proposed Route Selection



Design Basis - Other Facts

- Anticipated Flow Rate From Phase III Expansion is 390 Gallons/Minute
- Control Panels
- Fiber Optic Lines
- Reprogramming



Current Status

- Project Awarded on August 31, 2001
- Design and Pre-Construction Submittals
- Construction
- Post-Construction
- Estimated Completion by October 2002



Further Evaluation

- Upgrades to GWTP
- Optimal Pumping Rates



New Business and Program Closing

Mr. Steven W. Coyle
Installation Co-Chair



Next RAB Meeting:

10 January 2002



Please...

Recycle your name tag by leaving it at your seat... we will collect and reuse at the next RAB meeting.

Thank you!